Amendments to the Drawings

Please replace Drawing Sheet 2 with the replacement Drawing Sheet 2 enclosed herein. Applicants have clarified water adsorption media 130 and cleaning fluid regeneration adsorption media 135 in Figure 2.

Please replace Drawing Sheet 15 with the replacement Drawing Sheet 15 enclosed herein. Applicants have added step 780 in Figure 15.

REMARKS/ARGUMENTS

This amendment is responsive to the Office Action mailed September 11, 2006 wherein claims 1-18 were rejected. Claims 1-18 have been amended and claims 19-45 have been added. Claims 1-45 are currently pending.

Drawings

Applicants have enclosed a replacement Drawing Sheet 2 which clarifies water adsorption media 130 and cleaning fluid regeneration adsorption media 135 in Figure 2. The specification provides support in paragraphs [040] and [043].

Applicants have also enclosed a replacement Drawing Sheet 15 which adds step 780 in Figure 15. The specification provides support in paragraphs [108] and [109].

Specification and claim amendments

Applicants have amended the specification and claims to improve clarity. Applicants submit that no new matter has been added.

Claim rejections under 35 USC §103(a)

Claims 1-18 were rejected under 35 USC §103(a) as being unpatentable over U.S. patent 3,246,493 to Oles (hereinafter "Oles") in view of French patent 2,594,149 (hereinafter "France '149") or Japanese patent 2001-198394 (hereinafter "Japan '394") or U.S. patent 6,840,069 to France et al. (hereinafter "France"). Applicants respectfully traverse the rejection to claims 1-18.

Applicants have reviewed an English translation of the Title and Basic Abstract Text in France '194 provided by Derwent Information Ltd, and have reviewed an English translation of the Title and Abstract in Japan '394 provided by the Japanese Patent Office. Applicants' discussion of France '194 and Japan '394 is based on these English translations.

When viewed as a whole, Applicants' invention is directed towards an apparatus for detecting contaminants in a dry cleaning solvent, where the apparatus is designed for home or coin-op use. In order to detect dissolved contaminants that are not readily visible, Applicants' apparatus includes a solvent contaminant detection device that determines an amount of contaminants accumulated in the solvent using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminants. For instance, the electromagnetic detector is an ultraviolet detector that is responsive to ultraviolet radiation in a spectral band where the absorbance of the ultraviolet radiation by the contaminants has a substantially linear relationship to a concentration of the contaminants in the solvent. Applicants' apparatus can also include a turbidity sensor that detects readily visible particulates in the solvent. Applicants' apparatus can also include a display that notifies an operator to replace a regeneration cartridge that contains an adsorption media in response to the solvent contaminant detection device detecting that the concentration of the contaminants exceeds a predefined limit.

An appropriate level of solvent purity is paramount for effective washing. Contaminated siloxane solvent may be purified for reuse via an adsorption media that has a limited capacity for cleansing the solvent. When this capacity has been reached, the adsorbent no longer purifies the solvent and a filter bed should be replaced with fresh adsorbent. Presently, manufacturers of commercial-type dry cleaning equipment typically recommend bed exchanges based on off-line analysis or an estimated time for full capacity based on experience. For example, the manufacturer may recommend that the adsorption cartridge be exchanged every month based on average number of washes and contaminant (e.g., soil) concentrations regardless of the actual soil contents of the solvent. In contrast, Applicants' cleaning apparatus is capable of replacing the adsorbent as soon as it is saturated.

Claim 1 as amended herein is directed to an article cleaning apparatus and for illustrative purposes is reproduced in part below:

> An article cleaning apparatus comprising:
>
> a solvent contaminant detection device coupled to the fluid regeneration device that determines an amount of a contaminant accumulated in the solvent using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminant.

Claim 10 as amended herein is directed to an article cleaning apparatus and for illustrative purposes is reproduced in full below:

> A solvent contaminant detection device used in a dry cleaning apparatus that detects dissolved contaminants in a solvent used for dry cleaning comprising an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminants.

Claim 18 as amended herein is directed to an article cleaning apparatus and for illustrative purposes is reproduced in part below:

> An article cleaning apparatus comprising:
>
> a solvent contaminant detection device that detects dissolved contaminants in the solvent using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the dissolved contaminants, and is

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coupled to the controller to generate a
signal indicative of when to replace a
regeneration adsorption media that
purifies the cleaning fluid in response
to detecting the dissolved contaminants.
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The Office Action concedes that "Oles . . . differs from the claim [1, 10 and 18] only in the recitation of . . . a solvent contamination detection device to determine the amount of accumulated contaminant." Thus, Oles fails to teach or suggest a solvent contamination detection device.

The Office Action asserts that "The patents to France, Japan '394 and FRANCE '149 are each cited disclosing a solvent cleaning process, wherein said solvent cleaning process utilizes a solvent contamination detection device to determine the amount of accumulated contaminant in the solvent."

France '149 discloses a dry cleaning process that monitors the contamination level in a recycled solvent by detecting (1) excessive change in the density of the solvent, (2) change in transparency of the solvent, and (3) change in colour of the solvent. The monitoring indicates automatically when overcleaning or replacement of the solvent is necessary.

France '149 says nothing about how the change in density, transparency or colour of the solvent is detected. Thus, France '149 fails to teach or suggest detecting the contamination level using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminants (claims 1, 10 and 18).

France '149 also says nothing about adsorption media. Thus, France '149 fails to teach or suggest replacing a regeneration adsorption media in response to detecting the contamination level (claim 18).

Japan '394 discloses dry cleaning equipment that prevents reverse contamination of cleaned goods with contaminated detergent by detecting the level of contamination in a solvent in a tub. If the level of contamination reaches

a threshold value, then the solvent is discharged from the tub and transported to a distiller and new solvent is supplied to the tub.

Japan '394 says nothing about how the level of contamination is detected. Thus, Japan '394 fails to teach or suggest detecting the level of contamination using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminants (claims 1, 10 and 18).

Japan '394 also says nothing about adsorption media. Thus, Japan '394 fails to teach or suggest replacing a regeneration adsorption media in response to detecting the level of contamination (claim 18).

France discloses a dry cleaning apparatus that monitors lipophilic fluid vapor concentration in a drum. The apparatus includes condition sensors that activate a gas sensor to monitor the lipophilic fluid vapor concentration in the drum in response to conditions such as humidity, time, fabric load mass, temperature, lipophilic fluid flow and drum torque. The apparatus ends the drying cycle and permits a user to open a door and gain access to an internal chamber with the fabrics in response to the gas sensor indicating that the lipophilic fluid vapor concentration in the drum is safe.

France says nothing about detecting contamination in the lipophilic fluid. Thus, France fails to teach or suggest detecting contamination in the lipophilic fluid using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminants (claims 1, 10 and 18).

France also says nothing about adsorption media. Thus, France fails to teach or suggest replacing a regeneration adsorption media in response to detecting contamination in the lipophilic fluid (claim 18).

The Office Action asserts that "Re claims 2-6 and 11-14, France discloses the detection device (col. 9, lines 43-60) as claimed. Re claim 7-9 and 15-17, Japan '98394 and FRANCE '149 discloses the controller as claimed."

The cited text in France states as follows:

> Physical Property Sensors
>
> Physical property sensors generally leave the analyte gas undisturbed, and measure some property such as absorption of light or thermal conductivity.
>
> Nondispersive Infrared (NDIR)--These are the simplest of the spectroscopic sensors. The key components are an infrared source, a light tube, an interference (wavelength) filter, and an infrared detector. The gas is pumped or diffuses into the light tube, and the electronics measures the absorption of the characteristic wavelength of light. NDIR sensors are most often used for measuring carbon dioxide. The best of these have sensitivities of 25-50 PPM.
>
> Spectroscopic Sensors--These use conventional means to generate monochromatic light in the ultraviolet or infrared and to measure its absorption by a gas. An ultraviolet spectrometer, for example, is the 'gold standard' method for measuring ozone. Specific organic compounds can sometimes be individually measured by measuring absorption of infrared light at one or more wavelengths.

The cited text in France says nothing about detecting contamination in the lipophilic fluid. Instead, the cited text illustrates gas sensors for detecting the lipophilic fluid vapor concentration in the drum.

Claims 2 and 11 recite that "said electromagnetic source is an ultraviolet source and said electromagnetic detector is an ultraviolet detector" while claims 3 and 12 recite that "said electromagnetic source is an infrared source and said electromagnetic detector is an infrared detector" and claim 4 recites (and claim 13 essentially recites) that "said solvent contaminant detection device comprises

an ultraviolet source, a flow-through cell for passing samples of the solvent from the fluid regeneration device, and an ultraviolet detector responsive to ultraviolet radiation radiated from the ultraviolet source through the flow-through cell." France fails to teach or suggest detecting contamination in the lipophilic fluid, much less doing so with an ultraviolet source and an ultraviolet detector or an infrared source and an infrared detector.

Claim 5 recites (and claim 14 essentially recites) that "said solvent contaminant detection device further comprises a filter that passes ultraviolet frequencies in a bandpass responsive to at least one contaminant likely to accumulate in the solvent." France fails to teach or suggest detecting contamination in the lipophilic fluid, much less a filter with a bandpass responsive to a contaminant likely to accumulate in the lipophilic fluid.

Claims 8 and 16 recite that "[a signal is generated when a concentration of contaminants in the solvent reaches a predefined limit and] said predefined limit indicates degradation in a regeneration adsorption media in said fluid regeneration device." France '149 and Japan '394 fail to teach or suggest replacing a regeneration adsorption media in response to detecting the contamination level, as mentioned above for claim 18.

Claim 9 recites (and claim 17 essentially recites) "a turbidity sensor to detect particulates in the solvent that are readily visible, and said solvent contaminant detection device detects dissolved contaminants in the solvent that are not readily visible." France '149 and Japan '394 fail to teach or suggest dual sensors for detecting particulates that are readily visible and dissolved contaminants that are not readily visible.

Accordingly, for at least the reasons set forth above, Applicants submit that claims 1, 10 and 18 are allowable over to Oles in view of France '149 or Japan '394 or France. Furthermore, due at least in part to their dependency on claims 1 and 10, Applicants submit that claims 2-9 and 11-17 are similarly

allowable. As such, Applicants respectfully request that the rejections to claims 1-18 be removed and the claims be allowed.

New Claims

Independent claim 21 is allowable for at least the same reasons as claim 1, and independent claim 40 is allowable for at least the same reasons as claim 18. Claims 19 and 20 depend directly from claim 18, claims 22-39 depend directly or indirectly from claim 21, and claims 41-45 depend directly from claim 40. These dependent claims are similarly allowable.

Any additional fees for this amendment are hereby petitioned for, and the Director is authorized to charge such fees as may be required to Deposit Account 07-0868.

In view of the foregoing amendments and for the reasons set out above, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Should the Examiner believe that anything further is needed to place the application in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,

Jason K. Klindtworth
Reg. No. 47,211

General Electric Company
Building K1, Room 4A67B
Niskayuna, New York 12309

1/9, 2007

Telephone: (518) 387-7360 or
(518) 387-7122